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MR. EMERSON'S ADDRESS.

AN

ADDRESS,

DELIVERED AT THE OPENING

OF THE

BOSTON MECHANICS' INSTITUTION,

FEBRUARY 7, 1827.

arrell
BY GEORGE B. EMERSON.

BOSTON:
HILLIARD, GRAY, LITTLE, AND WILKINS.

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ADDRESS.

We are entering upon a new era in the history of science and the mechanic arts. We are this night assembled to open an Institution, whose object is to throw upon the business and labours of common life the light of reason and philosophy.

Science and art are of a kindred nature; they have a common origin, and were destined to go on together and assist each other; but they have been separated by the ignorance and necessities of men, and have both deeply suffered from the separation. It is the object of Mechanics' Institutions to reunite them; to give to the mechanic the scientific principles which shall be most useful to him in the daily operations of his art, and to gain from the labours and multiplied experiments of the mechanic, new facts for the illustration and advancement of science.

It will not be considered unappropriate to this occasion to give some account of the origin and history of Mechanics' Institutions abroad and in our own country. This sketch, however necessarily short, will serve to prove that it is not a doubtful benefit which we are endeavouring to gain; but that wherever institutions of this kind have been established, certain and permanent good has been effected.

We owe their first establishment to a country, from which we received a like gift of still greater value,—our admirable system of common schools; to a country, which has long been distinguished for its anxious attention to the education of its children, and whose children have, in consequence, wherever they are known, been distinguished for their intelligence, ability, and virtue. A Mechanics' Institution was first established in Scotland, at the Anderson College in Glasgow. Professor John Anderson seems to have been the first who instituted a series of lectures on Natural Philosophy, open to a class of mechanics and other men not pursuing a course of liberal education. This auspicious beginning having been made, the work was continued and carried farther by Dr. Birkbeck, and his successor, Dr. Ure; and with such permanent and increasing success, that in the last year more than a thousand mechanics of Glasgow enjoyed the benefit of philosophical lectures at two independent institutions in that city.

This system had been in constant and successful operation, however, more than twenty years, before the spirit was caught by the inhabitants of Edinburgh. In April 1821, in consequence of a conversation held with a watchmaker in that city, a Prospectus was issued, proposing lectures on Practical Mechanics and Chemistry, for the working classes; and so well was the plan received, that in October following, four hundred tickets for these lectures had been purchased. Connected with the establishment of lectures, was a library of books on subjects of science and the arts, which was soon opened to the members of the Institution. Other courses of lectures, one on Farriery and one on Architecture, were soon after introduced, and schools were begun for instruction in Geometry and Arithmetic. These schools were conducted by two mechanics, a joiner, named James Yule, and a cabinet-maker, named David Dewar, who suggested the plan and generously volunteered to give instruction to their associates.

The next important establishment of this kind was made at the great centre of action of the British empire. The London Mechanics' Institution was formed in November, 1823, and opened in the following January, by an Address by Dr. Birkbeck. Thus has this eminent philanthropist the glory of having been the first to act on the original suggestion of Prof. Anderson, and the honour of having ushered into notice a Society, destined, from its position, to have a highly important influence on the future advancement of the system. In the course of the first year, lectures were delivered on Chemistry, Geometry, Hydrostatics, Astronomy, Electricity, and even on the French Language. The interest felt in these objects has been constantly increasing, and upwards of a thousand mechanics now enjoy the advantages of the Institution.

The great success and necessary publicity of the proceedings of members of the London Institution informed and excited a spirit, which still continues and will long continue to be felt in all parts of the Island.* In the course of the year 1824, institutions of similar character and objects were formed in Newcastle, Carlisle, Manchester, Leeds, Liverpool, and many other places, both large and small, in Great Britain, and several also in Ireland. With most of these institutions are connected libraries of scientific and other valuable books, the use of which is enjoyed throughout the year, while the lectures are generally delivered only in the winter season.

Nor did the impulse which had been so strongly given by the friends of humanity in the British islands cease when it reached the limits of that realm. In France, Dupin was waiting to catch and welcome the spirit that was moving on the other side of the channel; he foresaw the mighty effects that must be produced by an agent of such power as the scientific instruction of all the mechanics of a nation, and was not backward to receive it because it emanated from the heart of a rival people.

This distinguished engineer had spent several years in Great Britain, in examining its canals, bridges, and roads, its forces by land and on the sea; was familiar with the processes and great results of its admirable arts; had learnt to value and respect the skill he saw displayed, and the industry with which it was applied, and had returned home from his pilgrimage of science, to enrich his native land with the treasures of his knowledge.

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* We ought not, in this place, to omit the mention of the great champion of popular education in England, Henry Brougham. To his chivalrous devotion to this cause, in the midst of parliamentary and professional business, we are to ascribe, in no small degree, the unparalleled progress which it has, for several years past, been everywhere making.

In an address to the most distinguished mechanics of Paris, assembled at the Conservatory of Arts and Trades, in which he is Mechanical professor, superior to the meanness of national prejudice, he points out to them the example of the English and Scotch; he calls upon them, in the name of their country, "to render it more opulent and happy, by adding to their own comfort and welfare, to render it stronger and more splendid, by making a more intelligent use of their own moral and physical powers." He offers them his assistance, and conjures them to set an example to France and the continent. "One man only," says Brougham, "is wanted in each place to secure the success of the plan;" and with so eloquent and able an advocate as Dupin, we may rest assured that Mechanics' Institutions, if not already established, will soon be established in France.*

On turning our eyes towards our own country, we are struck by an Institution, more extensive in its objects, and hitherto not less successful in the attainment of them, than any of those of which we have spoken. The Franklin Institute, in Philadelphia, went into operation early in 1824, and during that year lectures were delivered to the members, on Chemistry, Natural Philosophy, and Architecture. Voluntary lectures were also given by several gentlemen, on particular subjects in arts or science. To these there were added, in the November of the next year, courses of lectures on Mechanics and Natural History; and schools were opened, under the patronage of the Institute, for instruction in Drawing and the Mathematics. A farther object was to act upon the emulation of manufacturers by the establishment of annual exhibitions of manufactures, and the distribution of premiums, according to the excellence of the specimens offered. There have now been three annual exhibitions, many premiums have been awarded, and their effect is very manifest and satisfactory.

The other objects of the Institute are the establishment of a school for mutual instruction, the formation of a library, the collection of a cabinet of minerals and of models of machines, and a philosophical apparatus. Towards the accomplishment of all

* See Note, at the end.

these objects encouraging progress has been made. An excellent Mechanics' Magazine has been carried on for the past year under the care of the professor of Mechanics at the Institute, full of information of a very interesting nature. The members of the Institute at its commencement were 560—a year ago they were 1065.

Several other institutions have been formed in this country, in Maryland, New York, and in other states, and even in our own immediate vicinity.*

Wherever established, Mechanics' Institutions, when left to the management of the persons particularly interested in them, have gone on increasing in numbers and importance, and have uniformly been found to exert a most salutary influence on the moral habits, the industry, and the happiness of their members. When we reflect on these effects, and on the many other important results that are sure to follow from the instruction of the working classes in the principles of their arts, it seems surprising that the suggestion should not long ago have been made and universally acted on; that a professor at Glasgow should, within the memory of men now living, have been the first to do any thing towards this object, and that for more than twenty years after that man's death, only one solitary individual should have acted on the suggestion. But we rejoice that a spirit is now abroad, which cannot and will not be quenched, which has already communicated itself to so many bosoms in distant countries, and is everywhere acting with a constant and irresistible power.

The object of our Institution is, as has already been said, to give to persons, whose time is chiefly occupied with business or labour, knowledge of a kind to be directly useful to them in their daily pursuits. Of this kind is the Theory of Mechanics, showing the principles on which mechanical power of all kinds is gained, and all machines are constructed; Natural Philosophy, which explains the general nature of the great powers and bodies that exist in the universe, of air and water, for example, and the manner in which the works of man affect or are to be affected by them; and Chemistry, which makes known the particular nature and properties of all the substances, about which the art or science of man is occupied.*

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* Institutions for the scientific instruction of Mechanics and others are now in operation in Baltimore, New York, Rochester, and Waltham. Institutions of this kind, more or less extensive, but having the same general objects, have been established in several towns in Worcester county, and at Brooklyn, Windham county, Connecticut.

No one, we think, can for a moment doubt that if a labouring mechanic could be fully furnished with knowledge of these kinds, and at the same time his disposition and ability to labour be entirely undiminished, he would be greatly benefited by the acquisition. But there are those who think that the possession of knowledge and the exercise of the understanding are incompatible with a constant and diligent use of the physical powers; that vigor of mind and mechanical skill are inconsistent with each other.

Let us ask how and why this can be true. Will an artist perform less skilfully an operation, of which he understands the reason and the principle, than one which is dark and unintelligible? Is there any magic by which knowledge palsies the hand of skill, unnerves the arm of strength? Let a mechanic understand the nature of the material he employs, enable him to predict the effect which heat and air and moisture will have upon it, show him how to counteract that effect; will he, in consequence of this knowledge, produce a less durable work? Give him such an insight into the secrets of nature, as to enable him often to omit and always to shorten a process, which before was long and expensive; show him how to give a new temper and a keener edge to his tools; will he, from this saving of time and labour, become remiss, and conceive a disgust to his art? Carry him on until you have formed his judgment and refined his taste; will his customers complain when he adds to the other qualities of his goods a graceful figure and fashion?

Let us interrogate history upon this point. Let us take instances, and learn from them the effect of knowledge on the character of an individual as an artist—I mean an artist in the best and widest sense of the term.

* See Note, at the end.

Rennie was born in obscure life, was the son of poor parents, and brought up as an apprentice to a mill-wright. He several years pursued that occupation in Scotland, with great success. Availing himself of an opportunity to attend a school of Mathematics and Natural Philosophy, he so perfected his natural genius, that, leaving his former business and his native country, he became the most distinguished civil engineer in England, and left, as a monument of his genius, a structure,—we refer to the Waterloo bridge over the Thames,—which has been pronounced the most perfect of its kind in Europe.

James Watt was a mathematical instrument maker at Glasgow. By the dexterous application of a few principles in chemistry, which he had learnt of Dr. Black, he carried to perfection the steam-engine, a machine, which has added more to the mechanical power of man, and produced a wider direct change upon the arts, than any other invention of modern times.

I need not name to you another distinguished mechanic, your townsman, one who was born near the spot where we are now assembled, and in this town bound apprentice to a printer. For many years he wrought diligently in that calling; so diligently and with such skill, that there were few who could hold competition with him. He was wont to steal hours from sleep to give to study; but the fruits of that study enabled him, many years afterwards, to sustain the reputation of the genius and liberty of his country in more than one court in Europe.

These men all attained wealth and distinction for themselves, and bequeathed a noble example, an undying fame, to us and to posterity. What raised Watt and Rennie and Franklin from the humble condition in which they were born? What, but the cultivation of their powers by the very kind of knowledge which it is the object of our institution to offer to all?

These, however, it may be objected, are remarkable instances —exceptions from general principles—men who would have raised themselves to distinction from any situation.

But what is the effect of knowledge on great masses of men, when it is to be estimated in millions? Do we find that the manufactures of those countries, in which the education of the people has made some progress, fall short in quantity or excellence, of those produced by the same number of hands exerted with less intelligence? Hear the answer of a man, whose national prejudices must have been all on the other side, but who preferred truth to the gratification of the pride of his countrymen. "We are compelled to confess," says Dupin, "that fourteen millions of English and Scotch have more industry and produce a greater number of articles to convey to distant countries, than thirty or forty millions among the people of the continent." And what is the reason? Are the people of the continent less quick to learn; have they less capacity than the islanders? Dupin ascribes the difference,—and it is not easy to get better authority on this point,—to the skill which comes from knowledge—to the union of philosophy with art.

Granting then the practical usefulness of knowledge to the mechanic, there are some who will be ready to say, that however desirous they may be of obtaining it, they have no time,—the day of improvement with them has gone by,—they have grown too old to begin their education, and they have not, and cannot obtain, the previous knowledge which they suppose some of the instruction offered to them requires.

In the first place with regard to time: there certainly is no one who cannot find one hour in a week to attend a lecture on an interesting subject, which he may have in his thoughts all the rest of the week. If he do only this, he will find himself a great gainer at the end of the year. But this is not enough: to derive the greatest advantage from his lecture he must also read. And for this purpose, no one, who has a thirst for information, will find it difficult to find half an hour or an hour every day. In that short time a great deal may be done. Half an hour a day for a year amounts to six hours a day for more than a month. This is not a very short time to give to study; and this portion of time, frugally used, would enable a mechanic, with the aid of the lectures, to gain what he would always after consider an invaluable knowledge of Natural Philosophy, Chemistry, or almost any other branch of science. Let no one, therefore, who can spare half an hour a day, and who hopes to live a single year longer, complain that he has no time.

Again: it is a common opinion that the knowledge of natural philosophy cannot be acquired, in any considerable or useful degree, without some previous acquaintance with Mathematics. It is true that it is not easy, nor often perhaps possible, to go deeply into the theory of Natural Philosophy, without a very thorough knowledge of Mathematics. It is not our object to make deep philosophers, but intelligent and skilful mechanics; and there is a great deal, and that of the most practical kind of information, which can be acquired by a person, however advanced in life, without any preparatory knowledge of another science whatever. No mechanic, who has an opportunity and leisure to attend to Geometry, should fail to do it, for he will find it of constant use to him. But let no one be discouraged by his ignorance of this branch, and thereby be prevented from endeavouring to gain knowledge of another kind of more immediate utility.

There are then few or none, who have not enough of knowledge, of time, and of capacity, to be greatly benefited by the philosophical lectures and other means of improvement which it is the immediate object of this Institution to provide: and the benefit will not be confined to their character as mechanics. They will be benefited as moral agents—as members of society.

Let us imagine for a moment the condition of an individual, who has not advanced beyond the merest elements of knowledge, who understands nothing of the principles even of his own art, and inquire what change will be wrought in his feelings, his hopes, and happiness, in all that makes up the character, by the gradual inpouring of knowledge. He has now the capacity of thought, but it is a barren faculty, never nourished by the food of the mind, and never rising above the poor objects of sense. Labour and rest, the hope of mere animal enjoyment, or the fear of want, the care of providing covering and food, make up the whole sum of his existence. Such a man may be industrious, but he cannot love labour, for it is not relieved by the excitement of improving or changing the processes of his art, nor cheered by the hope of a better condition. When released from labour he does not rejoice, for mere idleness is not enjoyment, and he has no book, no lesson of science, no play of the mind, no interesting pursuit to give a zest to the hour of leisure. Home has few charms for him; he has little taste for the quiet, the social converse, and exchange of feeling and thought, the innocent enjoyments that ought to dwell there. Society has little to interest him, for he has no sympathy for the pleasures or pursuits, the cares or troubles of others, to whom he cannot feel nor perceive his bonds of relationship. All of life is but a poor boon for such a man; and happy for himself and for mankind, if the few ties that hold him to this negative existence be not broken. Happy for him if that best and surest friend of man, that messenger of good news from Heaven to the poorest wretch on earth, religion, bringing the fear of God, appear to save him. Without her to support, should temptation assail him, what an easy victim would he fall to vice or crime! How little would be necessary to overturn his ill-balanced principles, and throw him groveling in intemperance, or send him abroad on the ocean or the highway, an enemy to himself and his kind!

But let the light of science fall upon that man; open to him the fountain of knowledge. A few principles of philosophy enter his mind and awaken the dormant power of thought. He begins to look upon his art with an altered eye. It ceases to be a dark mechanical process, which he cannot understand; he regards it as an object of inquiry, and begins to penetrate the reasons and acquire a new mastery over his own instruments. He finds other and better modes of doing what he had done before, blindly and without interest, a thousand times. He learns to profit by the experience others, and ventures upon untried paths. Difficulties, which before would have stopped him at the outset, receive a ready solution from some luminous principle of science. He gains new knowledge and new skill, and can improve the quality of his manufacture, while he shortens the process and diminishes his own labour. Then labour becomes sweet to him; it is accompanied by the consciousness of increasing power; it is leading him forward to a higher place among his fellow men. Relaxation, too, is sweet to him, as it enables him to add to his intellectual stores, and to mature, by undisturbed meditation, the plans and conceptions of the hour of labour. His home has acquired a new charm; for he is become a man of thought, and feels and enjoys the peace and seclusion of that sacred retreat; and he carries thither the honest complacency which is the companion of well earned success. There, too, bright visions of the future sphere open upon him and excite a kindly feeling towards those who are to share in his prosperity. Thus his mind and heart expand together. He has become an intelligent being, and while he has learnt to esteem himself, he has also learnt to live no longer for himself alone. Society opens like a new world to him; he looks upon his fellow creatures with interest and sympathy, and feels that he has a place in their affections and respect. Temptations assail him in vain. He is armed by high and pure thoughts. He takes a wider view of his relations with the beings about and above him. He welcomes every generous virtue that adorns and dignifies the human character. He delights in the exercise of reason—he glories in the consciousness and the hope of immortality.

The advantages to the community from the general scientific education of mechanics are no less certain and important than those which will ensue to the individual. Many of them are perfectly obvious. It has, for example, been ascertained by well conducted and satisfactory experiments, what proportion it is necessary to give to walls, to enable them to resist any lateral or downward pressure to which they may be exposed; what proportion the flue, fireplace, and apartment to be warmed should have to each other, to ensure, under ordinary circumstances, the conveyance of the smoke; at what period trees should be felled, and in what way and for how long a time the wood should be seasoned, that it may suffer from decay or shrinking in the least possible degree. Make this kind of knowledge familiar to working masons, carpenters, and joiners, and you deliver us from some of the most annoying and intolerable of the lesser evils of life. As it now is, great masses of information of this practical kind are lying buried in books, or in the memories of studious men, who have no means of bringing it to its right destination. By an absurdity of misapplication, it has been hitherto communicated to those only, who, of all men in society, have least need and make least use of it. We would open these books to the mechanic; we would ask these learned men to pour out the treasures of their knowledge into the bosom of those who will cause its fruits to appear in every form of convenience, comfort, and elegance, with which polished art can adorn the institutions of society. Every individual will thus be directly benefited by the perfection to which the various products of the mechanic arts will be carried; while the increased activity and energy of one class will of necessity react upon every other class of the community.

Science, too, will not be without its ample share in these benefits. The light that she sheds, like the twice blest influence of mercy, will be thrown back with redoubled lustre on herself. Where there has heretofore been one observer, we raise up thousands. For one, unskilful experimenter, pursuing in the intervals of some graver task, his solitary, unaided, oft-interrupted researches, we crowd the workshops of a whole country with her votaries, all anxious to repay the debt of gratitude, eagerly bent on tracing nature in her changeful shapes, and with uninterrupted years, and myriads of ever varying experiments, filling up the storehouse of observation.

It may perhaps be asked, what need have the people of this city of more institutions for instruction. We have already schools of every kind, open to the children of all the inhabitants, from the age of four to the age of seventeen. We do more for universal education than is done in any city of the new or the old world? True; and on that very ground we form higher hopes for our Institution. Let us finish a system which is so nearly perfect. If so much is doing and has been done by the scientific education of mechanics, in countries where less than one tenth or one twentieth part of the population receive the benefits of common schools, what may we not hope to effect here, where all enjoy this precious advantage?*

The principles of science have hitherto been accessible to those only who were pursuing a course of study preparatory to

* See Note, at the end.

what are called the liberal professions. The poor and the occupied, if destined to the active pursuits of life, have been almost necessarily debarred from them. By Mechanics' Institutions they are offered to all, to the busy, the poor, and the uninformed; to those who have been taught their value by their want, and who are therefore ready to estimate and employ them.

We confess we are not unmoved spectators of this scene. We cannot look on, without a deep and joyful feeling, at the prospect which is opening before us. Thousands, at this hour, are listening to the lessons of philosophy, which come home to their own "business and bosoms." The gates of the temple of science, closed as with adamant, since the beginning of time, against all but a favoured few, are thrown wide open, and multitudes from the workshops and fields, from the mine, the forest, and the ocean, from every region of labour and action, are hastening up thither to partake and rejoice in the waters of intellectual life.

It was the praise of the best of the sages of Heathen antiquity, that he brought Philosophy down from Heaven to dwell among men. And she has always had some chosen heart for her habitation. We would give her a home in every breast. We are not among those who dread that she may be contaminated by dwelling in the tents of labour or the poor man's cottage. We would send her into every cottage in the land; to guide the steps of infancy, to cheer the lonely thoughts of the suffering, to stand a ministering angel at the altar of God.

Gentlemen of the Mechanics' Institute,

I am directed by the Board of Managers to make known to you the arrangements which have been made for the remainder of the season. Two gentlemen of the University, Professor Farrar and Dr. Webster, have consented to deliver gratuitously a few lectures on the subjects of Natural Philosophy and Chemistry. In consequence, however, of the lateness of the period at which we begin, a full course on any branch of science will not be attempted before the next season. In the meanwhile, measures will probably be taken for the formation of a library, to consist of books upon the various branches of science and art, and on other useful and practical subjects.

It is thought that one lecture a week will be sufficient, as those for whom the lectures are particularly intended will be constantly occupied in their own pursuits; if, on experiment, it should be found that a larger number would be more advantageous, and the funds of the Institution permit, a different arrangement may be made hereafter.

Suffer me, however, gentlemen, to say, that no one must expect to derive great benefit from the lectures, if he do nothing but listen. They are intended to afford subjects of thought; they must be called up when you are engaged in your pursuits; they must enter into your conversation, or much of the beneficial effect they are intended to produce will be lost.

Neither should any one rest satisfied with the very valuable, indeed, but insufficient information, afforded by lectures. Let them be a foundation, on which to build a large and capacious edifice of knowledge. Let them be an introduction to the use of books. The library is what must be depended on for instruction during all those months when the lectures are discontinued, and in books must the information be increased and perfected which is obtained from the lectures.

Let him who values his time and regrets the shortness of it, have always some good book by him, and devote to it those fragments of time which would otherwise be lost. Let him be careful of the filings of his gold.

You have come forward and organized the Institution which is this night opened; thus resolving to do for yourselves what no others could so well do for you. We draw from this movement an omen of success. If you feel that knowledge is the pearl of price, if you burn with that thirst of knowledge which has well been called the "most glorious characteristic of the age," half the great work is already done. Knowledge comes easily and surely to him who is resolved to obtain it. Show yourselves eager and earnest in the pursuit, and every noble and patriotic spirit will be with you; there is no man so high in genius or science in the land, who will not take pleasure and pride in being called to assist you.

Gentlemen, you are placed in the most favourable position to act upon others. The mechanics of a hundred towns in New England have their eyes upon you. Set them a noble example. Your delay has been long a cause of delay to them. Let your ardor now in this best of earthly causes, make them forget that you were not first to begin, and carry you forward in so triumphant a course, as shall leave far behind every kindred institution on the other shore of the ocean. Let that town which was the centre and spring of action in the revolution of liberty, be still the centre in this revolution of science.

I have pointed out to you the example of the men of England and Scotland, and they are worthy of imitation; they have done well and nobly. How long will you suffer them to be an example to you? If to them it be a matter of incomparable importance to cultivate the mind, to gain that intellectual power which is the chief distinction of our nature, to raise themselves in the scale of existence, when, in the mass of them, they have still to look up to grade above grade to the throne, in what language can I speak of its importance to you,—free, for every purpose of good, as the air of heaven! Acting for yourselves and for your children, with every thing that is great and excellent upon earth within your reach!

Note.—Some slight additions and alterations have been made in the preceding pages since they were delivered.

NOTES.

Referred to on page 8.

THESE subjects are not spoken of as the only ones contemplated by the Institution, far less as the only ones on which information might with great advantage be given to mechanics and other persons—by means of lectures: Architecture, Astronomy, Natural History, Physiology, the Arts, Farriery, and select points of Law, have already been successfully tried.

Architecture is peculiarly well suited to be treated of in popular lectures. Many persons, not only mechanics, but others desirous of cultivating their taste, might derive very valuable and interesting information from a few lectures on this subject.

Astronomy has so often been treated of with great success in this way, that it is unnecessary to say any thing to recommend it. It yields to no subject whatever in interest to a mixed audience.

Natural History has been very successfully made a subject of lectures at the Franklin Institute and at other institutions. The gratification of a large audience in the lectures now going on in this city, shows how interesting it may be made, under the management of learned and able lecturers.

Physiology, particularly the physiology of man, is exceedingly well suited, from its nature and universal importance, to be the subject of popular lectures. Every individual, who has any liberal curiosity whatever, must feel a curiosity on this subject. In the care of a family of children, in guarding against disease, in attendance on the sick, and in many other offices of social life, hints which might be given by an intelligent lecturer on Physiology could not fail to be very useful and interesting to an audience made up of mechanics, or any other class of persons whatever.

Lectures have been given, in several institutions, upon the processes of particular arts, by persons engaged in the practice of those arts. These have been found to be entertaining, and useful, not only to the audience, but in an especial manner to the volunteer lecturer himself.

Farriery, Agricultural Chemistry, Vegetable Physiology, and analogous subjects would be the most appropriate objects of attention to the members of Institutions formed in the midst of Agricultural districts.

Political Economy is obviously susceptible of being made very popular and useful in oral lectures. Many of its most important doctrines have, indeed, peculiar reference to artificers, and other labouring men. Such are the doctrines of wages, prices and consumption, rents and division of labour. Crude notions on all these subjects are frequently and almost necessarily imbibed, and might be corrected better in the mode we propose than perhaps any other practicable method.

The peculiar situation of the inhabitants of our perfectly free states renders some other subjects of the greatest interest and importance to them, which could not be so to the inhabitants of any other country. Such are the Federal Constitution and the constitutions of the separate states; the peculiarities in our modes and forms of government; election; constitution and proceedings of our various courts of justice. All these are most imperfectly known by thousands who are yearly called to exercise rights which suppose and demand a familiar knowledge of them all.

Schools, on the monitorial plan, might be formed for teaching such mechanics and others as were desirous to learn, Geometry, Algebra, Drawing, Book-keeping, and Geography. There are few places in which some individual qualified to teach in one or more of these branches, tolerably well, might not be found.

A remarkable instance of what may be done by the unassisted efforts of mechanics, or other persons, in obtaining useful knowledge, is given in the following extract from a letter of D. Bannatyne Esq., inserted in the Glasgow Mechanics' Magazine, and copied thence into the Franklin Journal for January, 1826.

" The Gas Light Chartered Company of this city, in which I hold a considerable interest, and of whose Committee of Direction I have for some years been a member, employs constantly between sixty and seventy men in the works. Twelve of these are mechanics, and the others furnace men and common labourers of different descriptions; forming, altogether, a community, not very promising as a body to be incited to adopt measures for their own intellectual improvement.

" A little more than three years ago, our Manager at the works, Mr. James B. Nelson, proposed to these men to contribute each a small sum monthly, to be laid out in books, to form a library for their common use. He informed them, that if they agreed to this, the Company would give them a room to keep the books in; which should be heated and lighted for them in winter; that in this room they might meet every evening, throughout the whole year, to read and converse, in place of going to the ale-house, as many of them had been in the practice of doing. That the Company would farther give them a present of five guineas to expend on books, and that the management of the funds, library, and every thing connected with the measure, should be entrusted to a committee of themselves, to be named and renewed by them at fixed periods.

"With a good deal of persuasion, Mr. Nelson got fourteen of the workmen to agree to the plan. A commencement was thus made. For the first two years, until it could be ascertained that the members would have a proper care of the books, it was agreed that they should not take them out of the reading-room, but that they should meet there every evening to peruse them. After this period, however, the members were allowed to take the books home; and last year they met only twice a-week at the reading-room to change them, and converse upon what they had been reading. The increase of the number of subscribers to the library was at first very slow; and at the end of the second year the whole did not amount to thirty. But from conversing with one another twice a week at the library, upon the acquisitions they had been making, a taste for science, and a desire for information, began to spread among them.

"They had a little before this time got an Atlas, which, they say, led them to think of purchasing a pair of Globes. And one from among themselves, Alexander Anderson, by trade a joiner, who had had the advantage of attending two courses of the lectures in the Andersonian Institution, volunteered, about the beginning of last winter, to explain to them, on the Monday evenings, the use of the Globes. Finding himself succeed in doing this, he offered to give them, on the Thursday evenings, an account of some of the principles and processes in Mechanics and Chemistry, accompanied with a few experiments. This he effected with a simplicity of illustration and usefulness of purpose that was delightful. He next, and while he was still going on with his lectures, undertook, along with another of the workmen, to attend in the reading-room, during the other evenings of the week, and teach such of the members as chose it, arithmetic.

"For the business of this season, the members of the Society, who conduct every thing themselves, have made a new arrangement.

"The individuals of the committee have come under an agreement, to give, in rotation, a lecture, either in Chemistry or Mechanics, every Thursday evening; taking Murray for their text book in the one, and Ferguson in the other. They intimate, a fortnight before, to the person whose turn it is, that he is to lecture from such a page to such a page of one of these authors. He has, in consequence, these fourteen days to make himself acquainted with his subject; and he is authorized to claim, during that period, the assistance of every member of the Society, in preparing the chemical experiments, or making the little models of machines for illustrating his discourse.

"It is a remarkable circumstance in this unique process of instruction, that there has been no backwardness found on the part of any of the individuals to undertake to lecture in his turn, nor the slightest diffidence exhibited in the execution. This I can attribute only to its being set about without pretension or affectation of knowledge, and merely as a means of mutual improvement. And nothing, I conceive, could have been better devised for accomplishing this end. Indeed, I might with confidence say, that under this simple system of mutual instruction, which has grown out of the train of circumstances above mentioned, these persons, many of whom, when they joined the Society, were in a state of complete ignorance, have acquired a clearer idea and more perfect knowledge of the subjects which have been brought under their consideration, than would be found to have been attained by any similar number of students, who had been attending the courses of lectures given in the usual way by the most approved lecturers.

"On the Monday evenings the Society has a voluntary lecture from any of their number, who chooses to give notice of his intention, on either of the branches of science already mentioned, or upon any other useful subject he may propose. And there is, with the general body, the same simple, unhesitating frankness, and disposition to come forward in their turn, that exists among the members of the committee, with regard to the lectures prescribed to them.

"The effect of all that I have been relating, has been most beneficial to the general character and happiness of these individuals; and we may readily conceive what a valuable part of the community they are likely to become, and what the state of the whole of our manufacturing operatives would be, if the people employed in every large work were enabled to adopt similar measures. What might we not then be entitled to look for in useful inventions and discoveries, from minds awakened and invigorated, by the self-discipline which such a mode of instruction requires?"

Referred to on page 14.

We learn from an estimate made by M. Ferrusac of Paris, that the proportion of children attending school to the whole population, is in the circle of Grutz in Germany, 1 to 9—in Scotland,1 to 10—England, 1 to 16—France, 1 to 30—Austria, 1 to 954. In Massachusetts and New York, the proportion, according to the last returns of the public schools, is that of 1 to 3 and a fraction.

CONSTITUTION

OF THE

BOSTON MECHANICS' INSTITUTION.

ARTICLE I.—TITLE AND OBJECT.

THE Society shall be known by the name of *The Boston Mechanics' Institution;* and its object shall be mutual instruction in the sciences, as connected with the mechanic arts.

ART. II.—MEMBERS.

1. Any person, twenty-one years of age, elected by a majority of the Board of Managers, shall become a member of this Institution, by paying a fee of two dollars for admission, and signing this Constitution; and shall forfeit his membership by neglecting, for three months, after notification from the Treasurer, to pay the annual assessment of two dollars.
2. The payment of twenty dollars shall constitute a person a member for life, and exempt him from all future assessments.
3. The Board of Managers may elect Honorary Members, by a vote of two thirds of their whole number.

ART. III.—MEETINGS.

1. A meeting of the Institution shall be held, annually, the first Monday in January, at six o'clock, P. M.
2. Special meetings shall be called by the President, when directed by the Board of Managers, or requested by fifteen members.

ART. IV.—OFFICERS.

1. The officers of the Institution shall be a President, three Vice Presidents, a Recording Secretary, a Corresponding Secretary, a Treasurer, and sixteen Directors; who shall constitute a Board of Managers.

2. The four first officers, and at least three fourths of the Directors, shall be, or shall have been, practical mechanics, manufacturers, artists, or engineers.

3. The officers shall be elected at the annual meeting in January, by the written or printed ballots of a majority of the members present. Should the election not be completed that evening, it may be finished at an adjourned meeting.

ART. V.—DUTIES OF OFFICERS.

1. The President, or, in his absence, one of the Vice Presidents, or, in their absence, a President pro tempore, shall preside at the meetings of the institution.

2. The Recording Secretary shall notify all meetings of the Institution, and of the Board of Managers, and shall keep a record of their proceedings.

3. The Corresponding Secretary, subject to the direction of the Board of Managers, shall be the organ of communication with other Institutions or individuals.

4. The Treasurer shall collect and rebeive all moneys of the Institution. He shall exhibit an accurate statement of his receipts and payments, at the annual meeting of the Institution, and whenever called upon by the Board of Managers; to whom he shall give such bonds for the faithful performance of his trust, as they shall require. He shall make no payment without their warrant.

5. To the Board of Managers shall be confided, in general, all the concerns of the Institution, with authority to devise and execute such measures as may promote its objects. They shall exhibit, at every meeting of the Institution, the records of their proceedings. They shall have power to fill vacancies in their Board, from members of the Institution, and to make by-laws for its government.